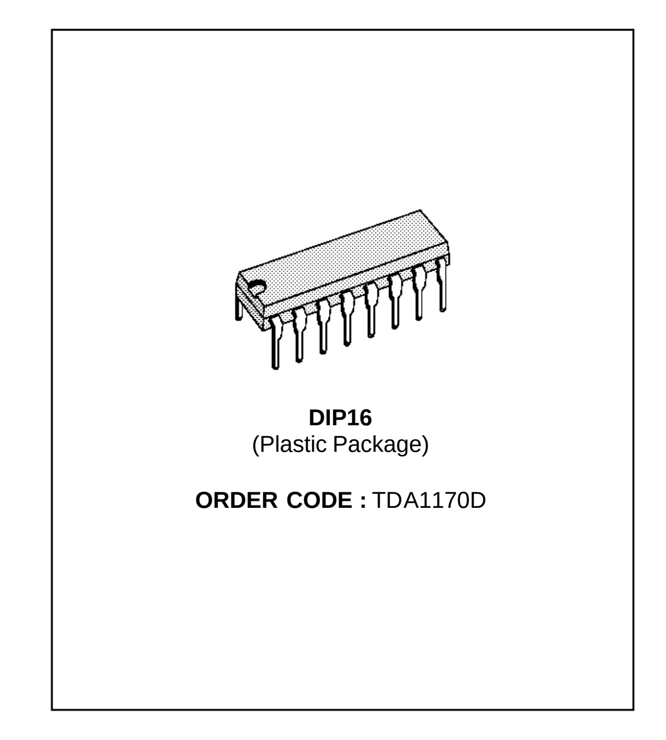


TDA1170D

LOW-NOISE TV VERTICAL DEFLECTION SYSTEM

- COMPLETE VERTICAL DEFLECTION SYSTEM
- LOW NOISE
- SUITABLE FOR HIGH DEFINITION MONITORS



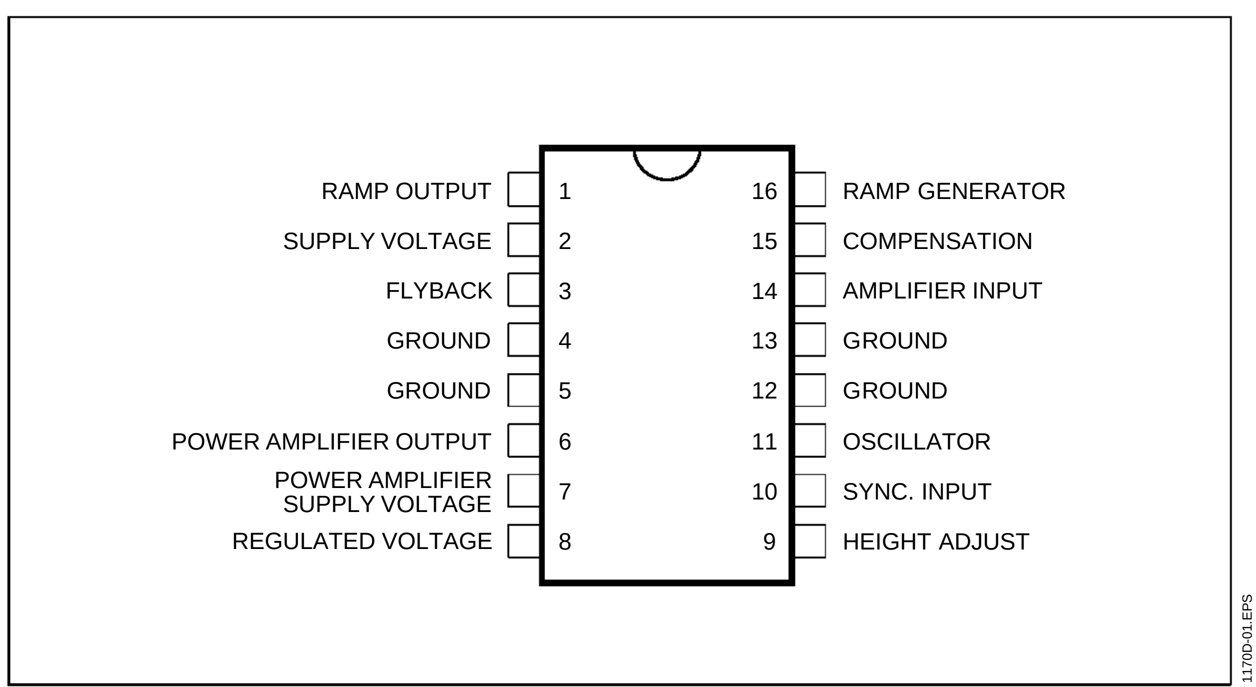
DIP16
(Plastic Package)

ORDER CODE : TDA1170D

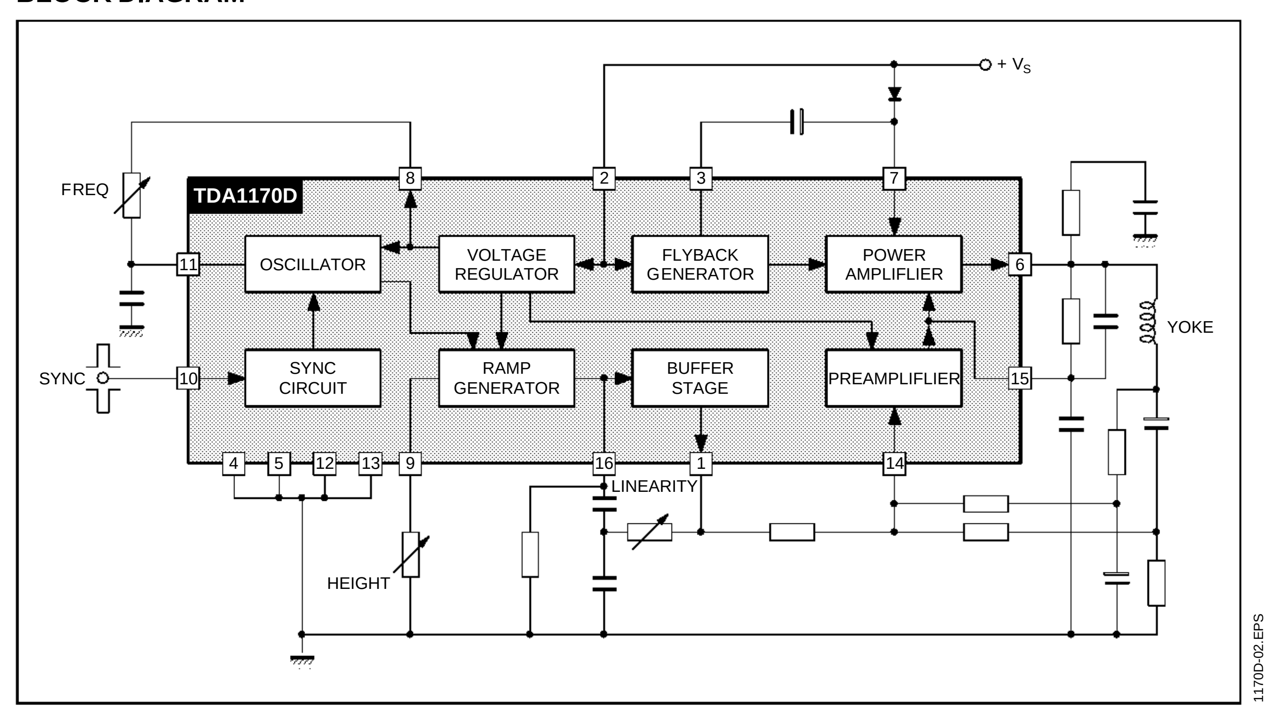
DESCRIPTION

The TDA 1170D is a monolithic integrated circuit in a 16-lead dual in-line plastic package. It is intended for use in black and white and colour TV receivers. **Low-noise makes this device particularly suitable for use in monitors.** The functions incorporated are : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator, voltage regulator.

PIN CONNECTIONS



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage at Pin 2	35	V
V_6, V_7	Flyback Peak Voltage	60	V
V_{14}	Power Amplifier Input Voltage	+ 10 – 0.5	V V
I_o	Output Peak Current (non repetitive) at t = 2msec	2	A
I_o	Output Peak Current at f = 50Hz t ≤ 10µsec	2.5	A
I_o	Output Prak Current at f = 50Hz t > 10µsec	1.5	A
I_3	Pin 3 DC Current at $V_6 < V_2$	100	mA
I_3	Pin 3 Peak to Peak Flyback Current for f = 50Hz, t_{fly} ≤ 1.5msec	1.8	A
I_{10}	Pin 10 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{tab} = 90°C at T_{amb} = 70 ° C (free air)	4.3 1	W W
T_{stg}, T_j	Storage and Junction Temperature	– 40 to 150	°C

1170D-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ j-case}$ $R_{th\ j-amb}$	Thermal Resistance Junction–pins Thermal Resistance Junction-ambient	Max Max	14 80	°C/W °C/W*

1170D-02.TBL

* Obtained with pins 4, 5, 12, 13 soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS

(refer to the test circuits, V_S = 35V, T_{amb} = 25°C, unless otherwise specified)

DC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b
I_7	Pin 7 Quiescent Current	$I_6 = 0$		8	17	mA	1b
$-I_{11}$	Oscillator Bias Current	V_{11} = 1V		0.1	1	µA	1a
$-I_{14}$	Amplifier Input Bias Current	V_{14} = 1V		1	10	µA	1b
$-I_{16}$	Ramp Generator Bias Current	$V_{16} = 0$		0.02	0.3	µA	1a
$-I_{16}$	Ramp Generator Current	I_9 = 20µA, $V_{16} = 0$	18.5	20	21.5	µA	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	ΔV_{16} = 0 to 12V, I_9 = 20µA		0.2	1	%	1b
V_S	Supply Voltage Range		10		35	V	–
V_1	Pin 1 Saturation Voltage to Ground	I_1 = 1mA		1	1.4	V	–
V_3	Pin 3 Saturation Voltage to Ground	I_3 = 10mA		300	450	mV	1a
V_6	Quiescent Output Voltage	V_s = 10V R1 = 1kΩ, R2 = 1kΩ	4.1	4.4	4.75	V	1a
		V_s = 35V R1 = 3kΩ, R2 = 1kΩ	8.3	8.8	9.45	V	1a
V_{6L}	Output Saturation Voltage to Ground	$-I_6$ = 0.1A $-I_6$ = 0.8A		0.9 1.9	1.2 2.3	V V	1c 1c
V_{6H}	Output Saturation Voltage to Supply	I_6 = 0.1A I_6 = 0.8A		1.4 2.8	2.1 3.2	V V	1d 1d
V_8	Regulated Voltage at Pin 8		6.1	6.5	6.9	V	1b
V_9	Regulated Voltage at Pin 9	I_9 = 20µA	6.2	6.6	7	V	1b
$\frac{\Delta V_8}{\Delta V_S}, \frac{\Delta V_9}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	ΔV_S = 10 to 35V		1		mV/V	1b
V_{14}	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	–
R10	Pin 10 Input Resistance	$V_{10} \leq 0.4V$	1			MΩ	1a

1170D-03.TBL

Figure 1 : DC Test Circuit

Figure 1a

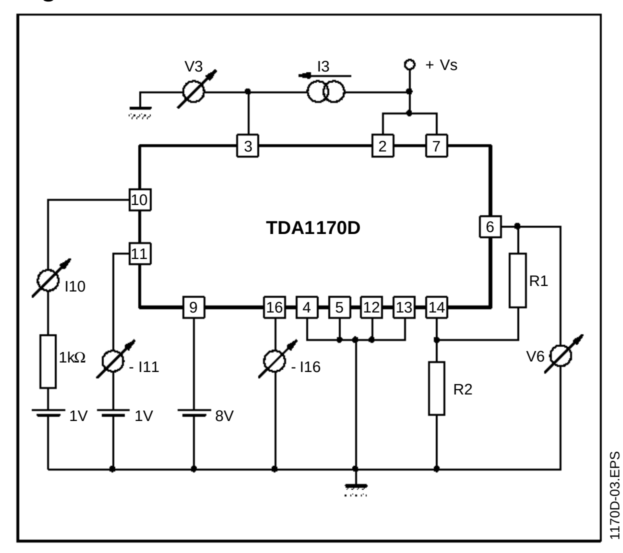


Figure 1b

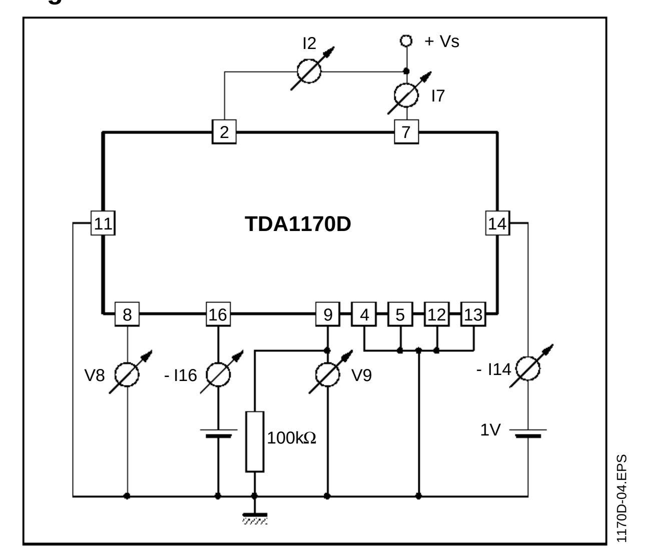


Figure 1c

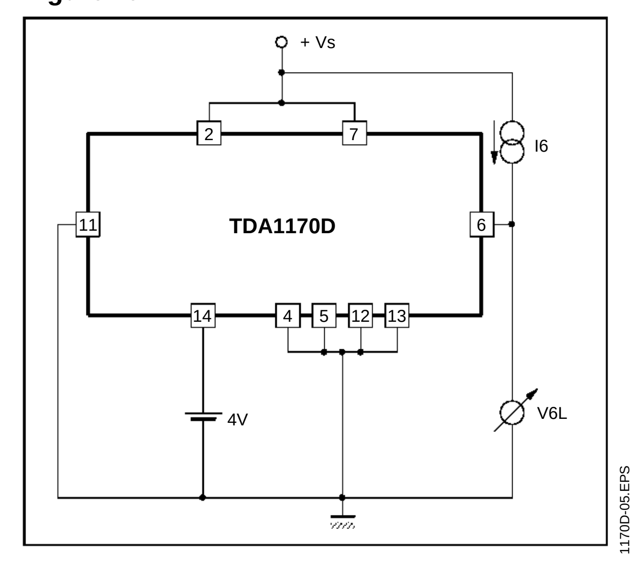
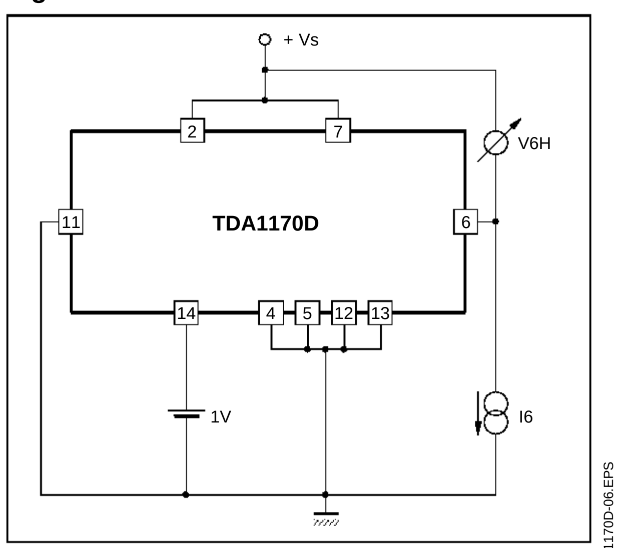


Figure 1d



ELECTRICAL CHARACTERISTICS

(refer to the AC test circuit, V_S = 22V ; f = 50Hz ; T_{amb} = 25°C, unless otherwise specified)

AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	I_y = 1App		140		mA
I_{10}	Sync. Input Current (positive or negative)		500			µA
V6	Flyback Voltage	I_y = 1App		45		V
t_{fly}	Flyback Time	I_y = App		0.7		ms
V_{ON}	Peak to Peak Output Noise	Pin 11 Connected to GND			40	mV_{PP}
f_o	Free Running Frequency	(P1 = R1) = 260kΩ, C2 = 0.1µF (P1 = R1) = 300kΩ, C2 = 0.1µF		48.5 42.2		Hz Hz
Δf	Synchronization Range	I_8 = 0.5mA	14			Hz
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V_s = 10 to 35V		0.005		Hz/V
$\frac{\Delta f}{\Delta T_{pins}}$	Frequency Drift vs. Pins 4, 5, 12 and 13 Temp.	T_{pins} = 40 to 120°C		0.01		Hz/°C

1170D-04.TBL

Figure 2 : AC Test Circuit

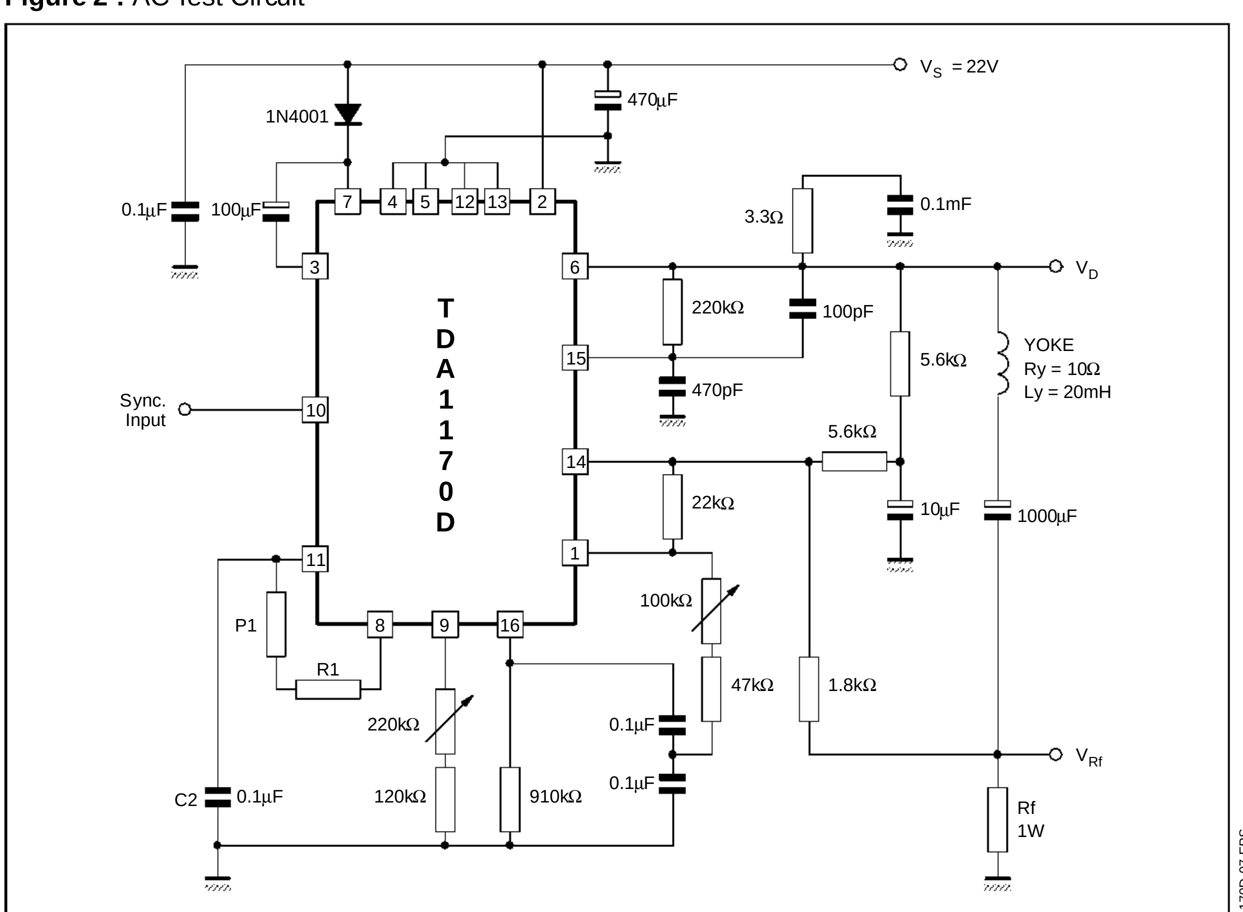


Figure 3 : Typical Application Circuit for Smal Screen B/W TV SET (Ry = 2.9Ω, Ly = 6mH, Iy = 1.1App)

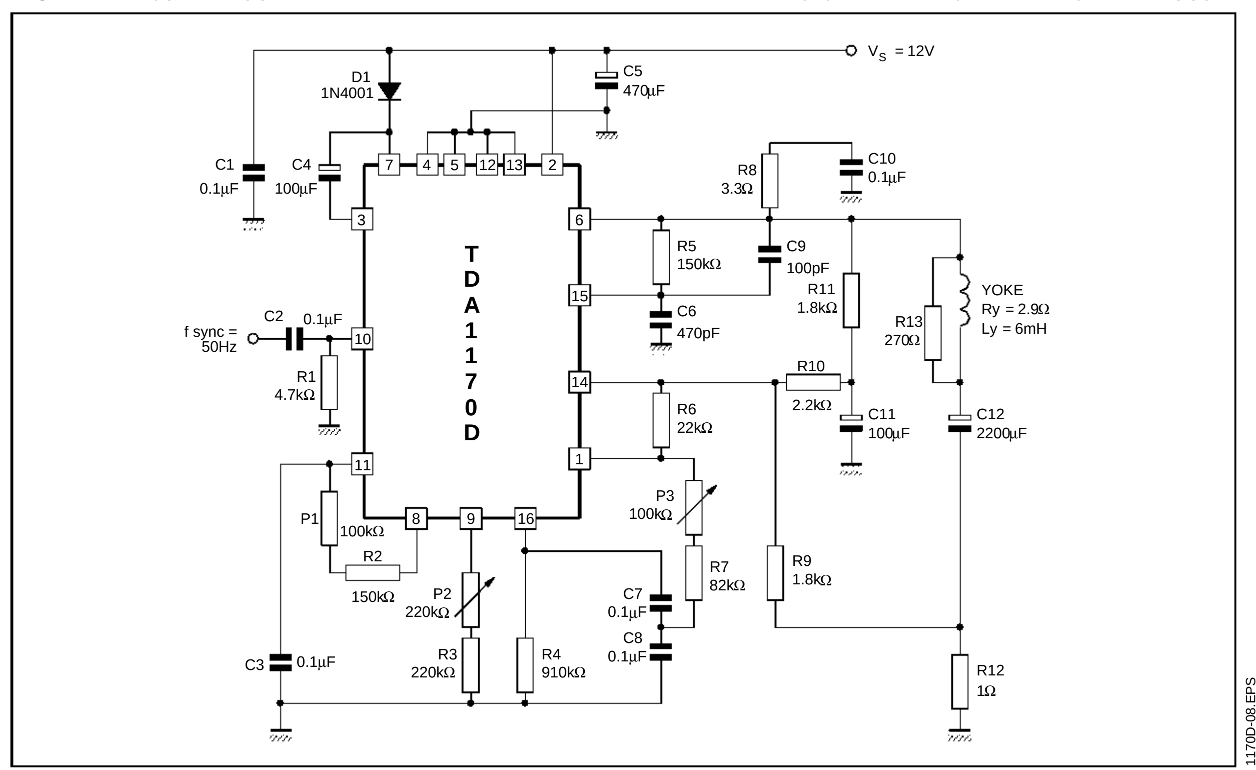
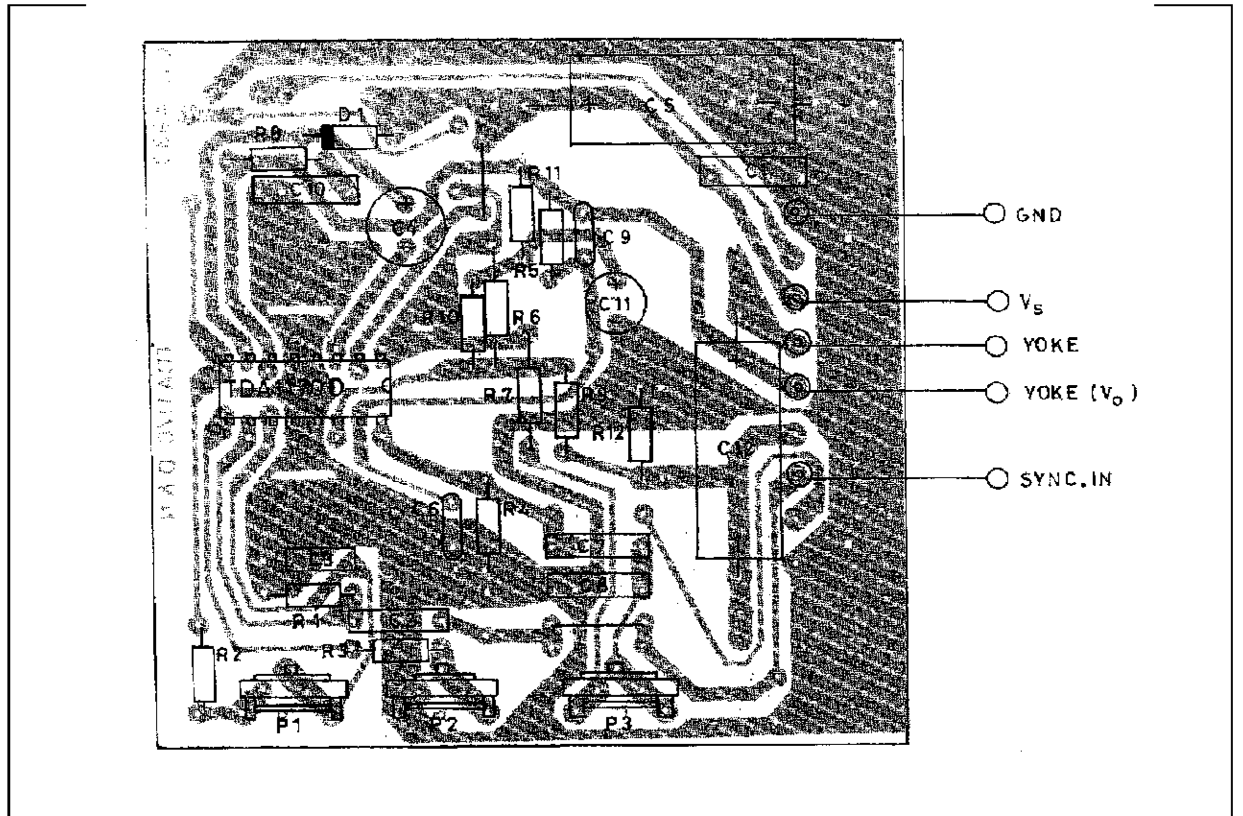


Figure 4 : P.C. Board and Components Layout of the Circuit of Fig. 3 (1 : 1 scale)



MOUNTING INSTRUCTION

The $R_{th\ j\text{-}amb}$ of the TDA 1170D can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (fig. 5) or to an external heatsink (fig. 6).

The diagram of figure 7 shows the maximum dissipable power P_{tot} and the $R_{th\ j\text{-}amb}$ as a function of the side "l" of two equal square copper areas having a thickness of 35 µ (1.4 mils).

During soldering the pins temperature must not exceed 260 °C and the soldering time must not be longer than 12 seconds.

The external heatsink or printed circuit copper area must be connected to electrical ground.

Figure 5 : Example of P.C. Board Copper Area which is Used as Heatsink

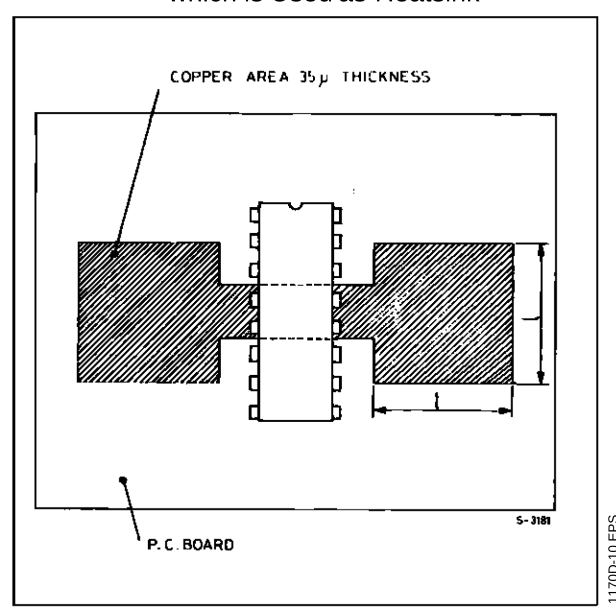


Figure 6 : External Heatsink Mounting Example

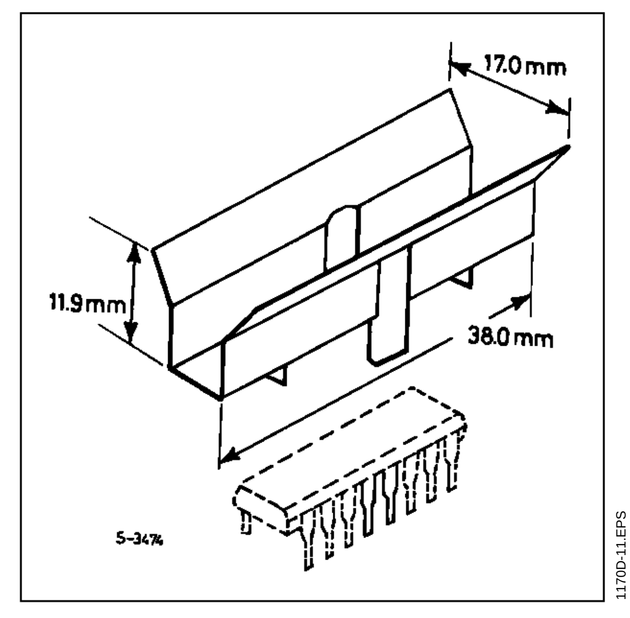


Figure 7 : Maximum Dissipable Power and Junction-Ambient Thermal Resistance versus Side "l"

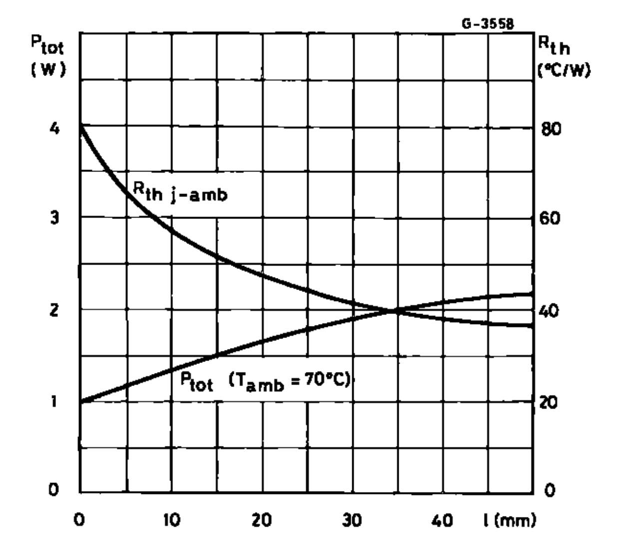
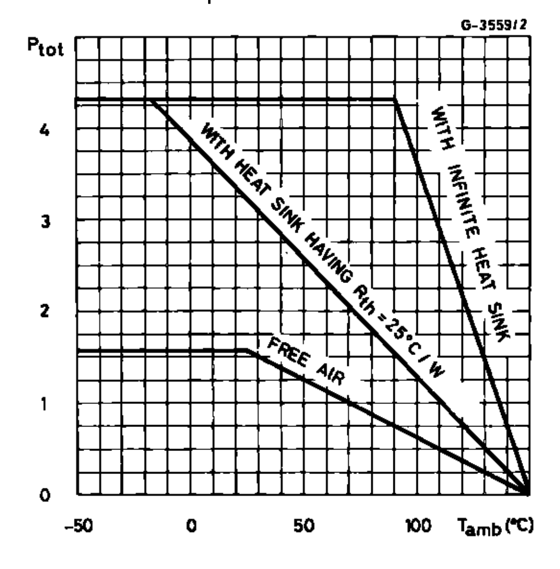
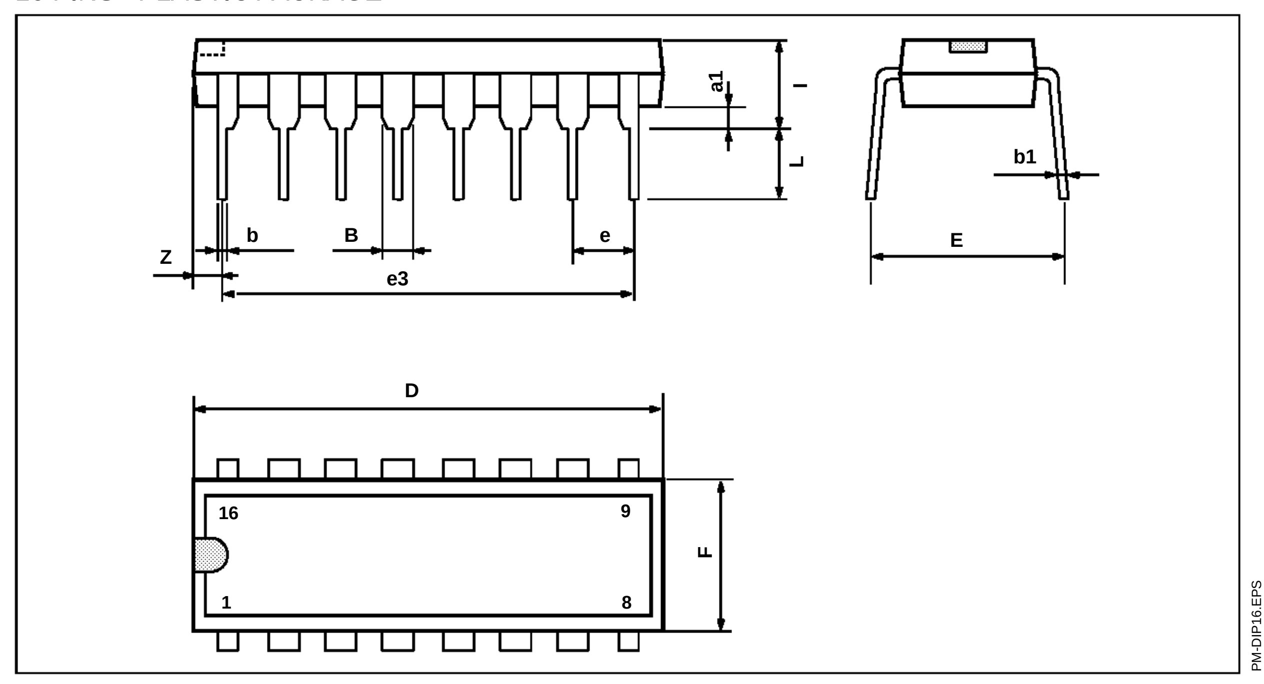


Figure 8 : Maximum Allowable Power Dissipation versus Ambient Temperature



PACKAGE MECHANICAL DATA

16 PINS - PLASTIC PACKAGE



PM-DIP16.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

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